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Letter to the Editor

COVID-19 anti-vaccine movement and mental health: Challenges and the way forward

Vaccination is one of the most cost-effective public health interventions in infectious disease outbreaks if it is made accessible and acceptable to the people (Lahariya, 2016). Recently, many countries have approved some coronavirus disease (COVID-19) vaccines and are presently adopting nationwide vaccination strategies to protect people from COVID-19 infection (Nature, 2020). However, these promising COVID-19 vaccines may not be accessible, acceptable, and affordable to people, especially those in low and middle-income countries (LMICs) due to multiple barriers such as a lack of adequate resources, safety concerns, and the emergence of an anti-vaccine movement (Burki, 2020; Nature, 2020). In this letter, we aim to explore the potential impact of this anti-vaccine movement on the COVID-19 vaccination program and mental health.

The anti-vaccine movement is not a new phenomenon and has occurred in most of the infectious disease outbreaks in past (Hussain et al., 2018). These movements tend to present the vaccine as more harmful than the disease itself by linking vaccines with other illnesses (e.g., in 1998, the measles-mumps-rubella (MMR) vaccine was linked with autism) (Smith, 2017). The COVID-19 anti-vaccine movement appears to be fueled by conspiracy theories, false beliefs, a lack of confidence among stakeholders, and a presumed lack of transparency (e.g, efficacy, and safety) in the vaccine approval process (Zadrozny, 2020). In addition, many people appear to harbor low-risk perceptions of COVID-19 infection due to good recovery rates especially among the young.

The COVID-19 pandemic and mitigation measures such as lockdowns have increased the prevalence of mental health issues through the disruption of mental health services (Tandon, 2021; Xiong et al., 2020). The anti-vaccine movement may further prolong the duration of the COVID-19 pandemic and may increase mortality or morbidity, resulting in an exacerbation of health inequalities and flaring the economic and social disparities. This may lead to not only an increase in the burden of COVID-19 infection but also mental health issues in poorer and marginalized people across the different LMICs.

Using Hagood and Mintzer Herlihy's model, people involved in the anti-vaccine movement can be categorized into three types' viz. vaccine rejecters, vaccine-resistant, and vaccine hesitancy (Hagood and Mintzer Herlihy, 2013; Smith, 2017). This categorization helps to understand their motives, reasons, and concerns. A small proportion of people are vaccine rejecters who refuse to consider COVID-19 vaccine information, are prone to conspiracy theory thinking (e.g., denying the epidemic or linking it with politics), and favor complementary or alternative medical practices. They are not likely to vaccinate themselves or their children. Their opinions are difficult to change, but sometimes, they may accept some vaccines. Vaccine-resistant people on the other hand may reject vaccination but are simultaneously searching and willing to consider information about COVID-19 vaccines. They have anxiety about vaccinations and are ambivalent towards conspiracy theories. Interventions addressing their concerns may increase their COVID-19 vaccine acceptance. On the other hand, vaccine-hesitant people are not strongly committed to either a pro or anti-vaccine stance. This group emerges after initiating the COVID-19 vaccination program. They may avoid COVID-19 vaccinations due to some minor beliefs or concerns such as fever after vaccinations. Simple interventions such as educating about the vaccine at a local level can improve COVID-19 vaccine acceptance among them.

Advocating globally for the COVID-19 vaccine will not be easy due non-availability of a one-size-fits-all model for different groups of people. However, psycho-social interventions should be developed to address the anti-vaccine movement considering local concerns, underlying beliefs, and culture.

Some Recommendations:

- **Information, Education, and Communication (IEC)**: The information-deficit model of health communication considers that people are more likely undereducated about COVID-19 vaccines and that providing additional factual information will fill the knowledge gap and lead people toward vaccinating themselves (Smith, 2017).
- **Approaches:** Government websites, help centers, and National COVID-19 vaccine helplines should be prepared to educate people about the vaccine. Public leaders and health care professionals should acknowledge the different concerns, values, and beliefs of people. One-way science communication that expects the public to passively accept vaccination should be avoided (Smith, 2017). The previous experiences under the immunization program can help to identify the pockets of vaccine refusal in different regions.
- **Community Interventions**: Community health workers are more likely to be in direct contact with people during vaccination. They should be trained in providing brief counseling to a different group of individuals (e.g., vaccine-hesitant). The involvement of schools, colleges, and other community institutes can be a feasible approach in many countries.
- **Innovative programs**: To improve community acceptance, innovative programs should be developed at different levels of health care systems. E.g., COVID-19 vaccine ambassador program in which the people who get vaccinated can educate others about the importance of vaccination through social media
- **Capacity building for COVID-19 vaccinations**: A multidisciplinary team inclusive of health-care workers (HCWs), public health experts, local political leaders, and mental health professionals should be developed to increase COVID-19 vaccine acceptance.

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- **Monitoring the social media**: Promoting the idea that vaccination is "normal" and monitoring social media for misinformation is key.
- **International collaboration**: The infodemic and anti-vaccine movement will not restrict to any specific country (Eysenbach, 2020). Therefore, government and international agencies should be well prepared to respond appropriately, adequately, and quickly to the COVID-19 vaccine concerns.
- **Mental health:** COVID-19 vaccination is an opportunity for mental health professionals to screen people for common mental illness through public health systems and increasing investment in mental health for a future pandemic (Adiukwu et al., 2020). Persons with severe mental illness should be prioritized so that they can access mental health services regularly.

To conclude, the COVID-19 anti-vaccine movement can affect community health, and possibly prolong the COVID-19 pandemic, and will inadvertently increase the burden of mental health issues. A systematic approach, appropriate innovative interventions, and global-public health initiatives are needed to prevent this.

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Declaration of Competing Interest

The authors declare that they have no conflict of interest.

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Ramdas Ransing*
Department of Psychiatry, BKL Walawalkar Rural Medical College, Ratnagiri, 415606, Maharashtra, India

Elona Dashi
Department of Neuroscience, University Hospital Center "Mother Theresa", Tirana, Albania

Sajjadur Rehman
Department of Psychiatry, Lady Hardinge Medical College, New Delhi, 110001, India

Ashish Chepure
Department of Psychiatry, Vilasrao Deshmukh Government Institute of Medical Sciences, Latur, Maharashtra, India

Varun Mehta
Department of Psychiatry, Central Institute of Psychiatry, Kanke, Ranchi, 834006, India

Ganesh Kudva Kundadak
Early Psychosis Intervention Programme, Institute of Mental Health, Singapore, 539747, Singapore

* Corresponding author.
E-mail address: ramdas_ransing123@yahoo.co.in (R. Ransing).